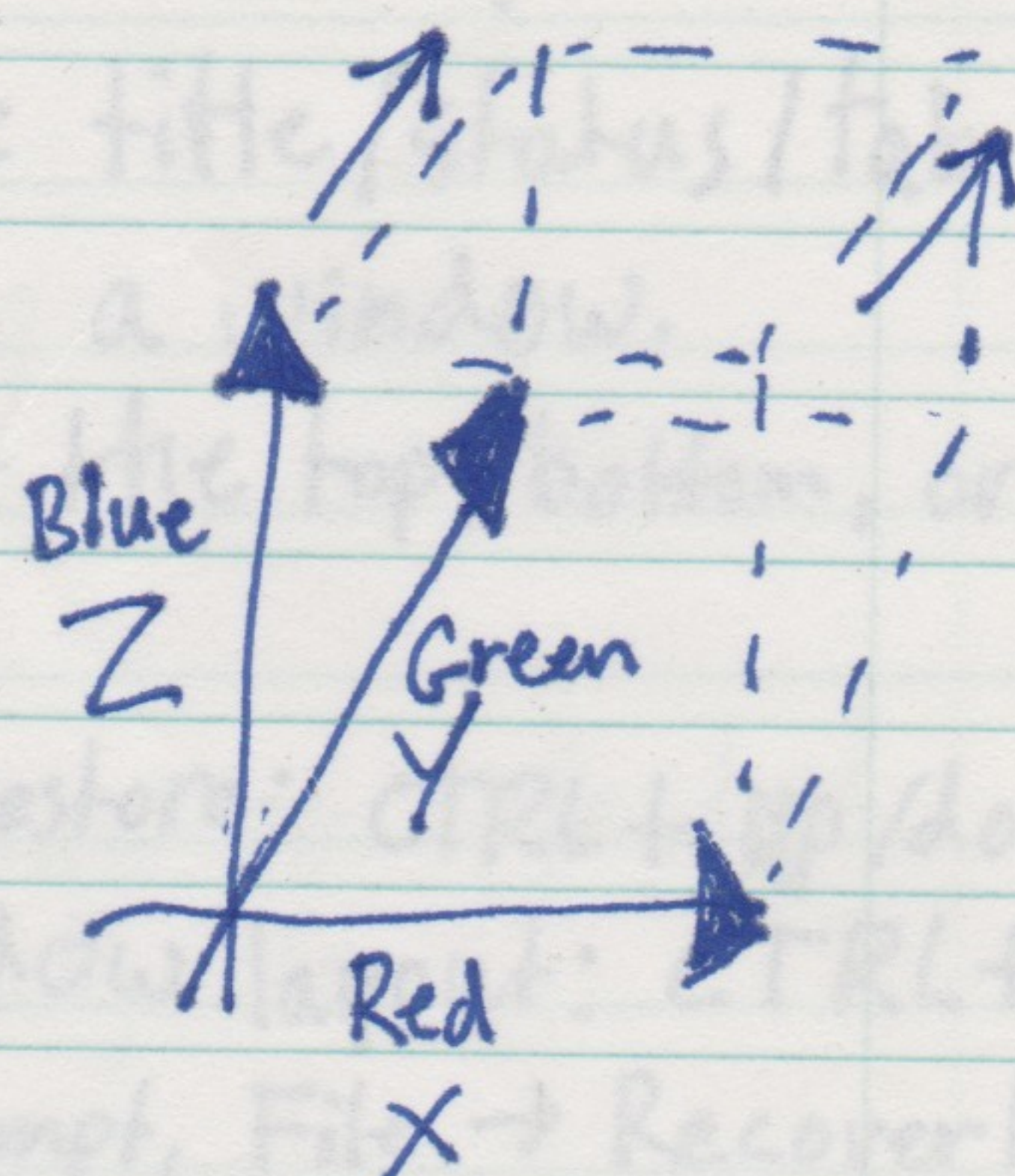


Blender Notes

Transformations:

Translation → Move
Rotation → Turn
Scale → Resize



Inverse transformation is the reverse of the original transformation, i.e. undo!

Global coords → scene-wide

Local coords → Object-specific, moves with it
(origin = "center of object")
does not need to be actual center
wholesale... shape/size kept intact, object moves like a "block".

Edges

Vertex

vertices —

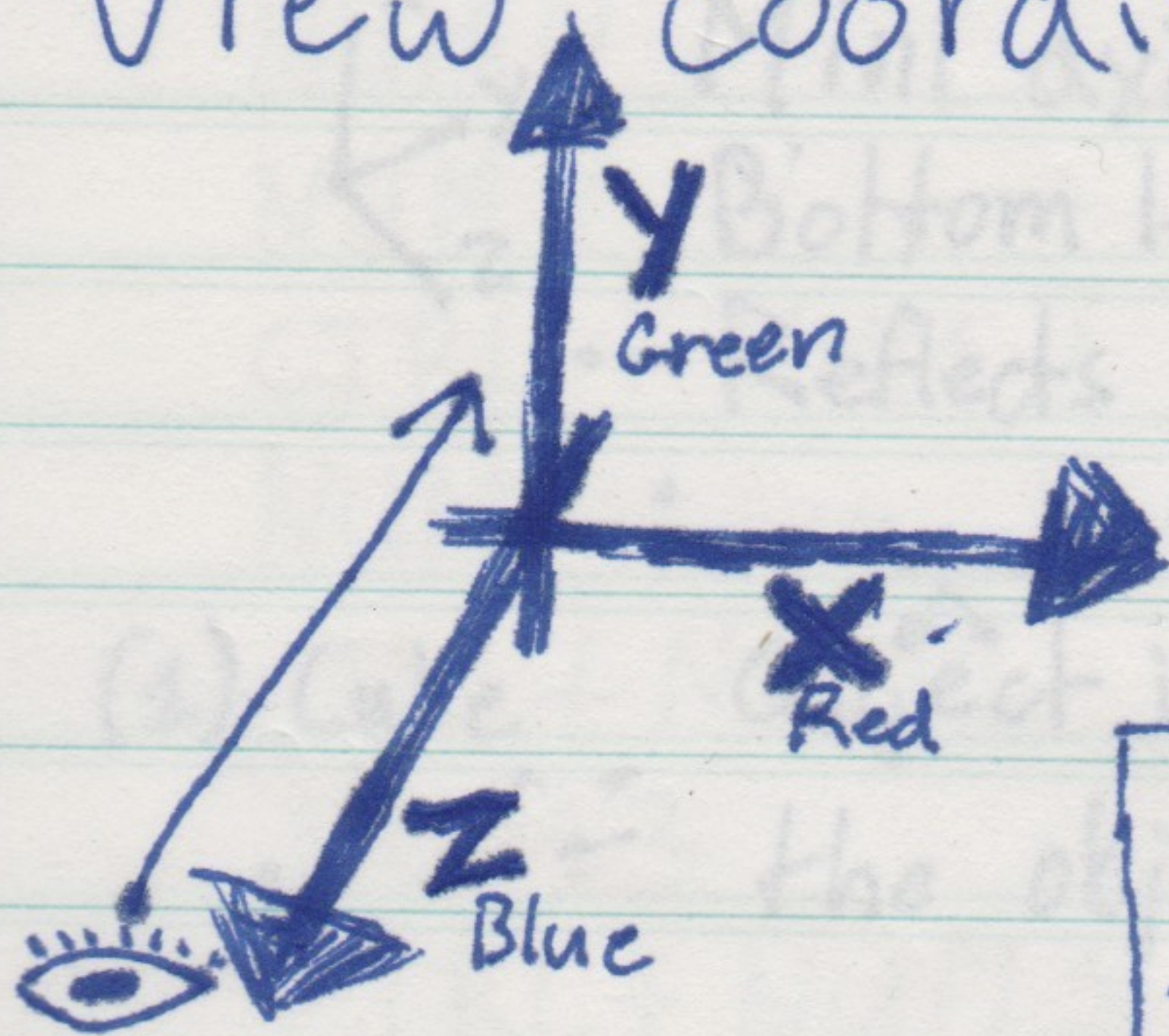
Parent → children:
(hand holds cup and rotates)

Lines between vertices

points in a model

child coords are calculated relative to the parent not relative to the global coords!

View coordinates



Re-orienting on the global coordinate cross would make you look straight down.
X and Y would be oriented like a graph.

UV coordinates

U, V = X, Y on a rasterized image, avoids confusion.

UV-mapping = wrapping an image/texture around a 3D model, translating UV to XYZ.

Surface normal (orientation)

This is an orientation (visualized through a cross) that is parallel to the selected surface(s) X/Y-wise.

Multiple Faces: averaged from selected faces

Point(s): averaged from faces adjacent to selected point(s).

Interface

Panes: T object tools
(shelves) N properties
/transform

⊕ restores a hidden shelf or header

Scroll: drag middle mouse button

Scenes share materials, objects, etc.

Header = title/status/tab bar for a window.

May be at the top, bottom, or hidden.

Maximize/restore: CTRL + up/down

Switch window layout: CTRL + left/right

No save prompt, File → Recover Last Session.

CTRL + U Save all changes to base skeleton (template) document.

CTRL + ALT + U User preferences window pop-up.

CTRL + Space Enable/disable "manipulator", the coordinate cross.

Z Enable/disable wireframe rendering mode.

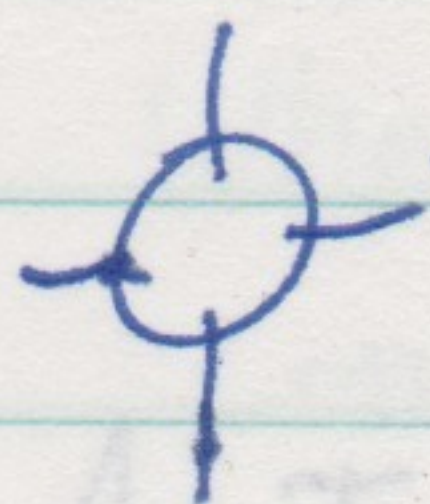
NUM5 Switch between orthographic/isometric and perspective view.

SHIFT + S Selection/cursor snap operations.

SHIFT/CTRL + Scroll Panning vertically/horizontally (like side-scrolling).

CTRL + NUM. Re-center view on ~~cursor~~ center.

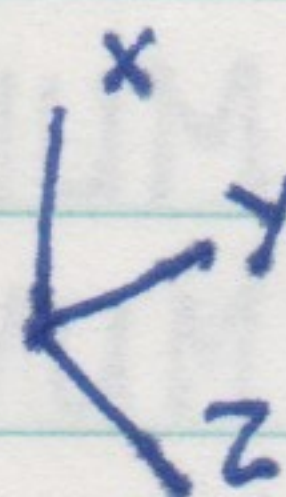
ALT + Home Re-center view on cursor.



3D Cursor (crosshair)

Insertion point, similar to cursor in a text area.

New objects are created at this position.



Mini axis

Bottom left corner in 3D view. Like a compass...

Reflects the orientation of the global coordinate system.

(1) Cube Object info. Notation is (#frame) \$object_name, where the object name reflects the currently selected object.

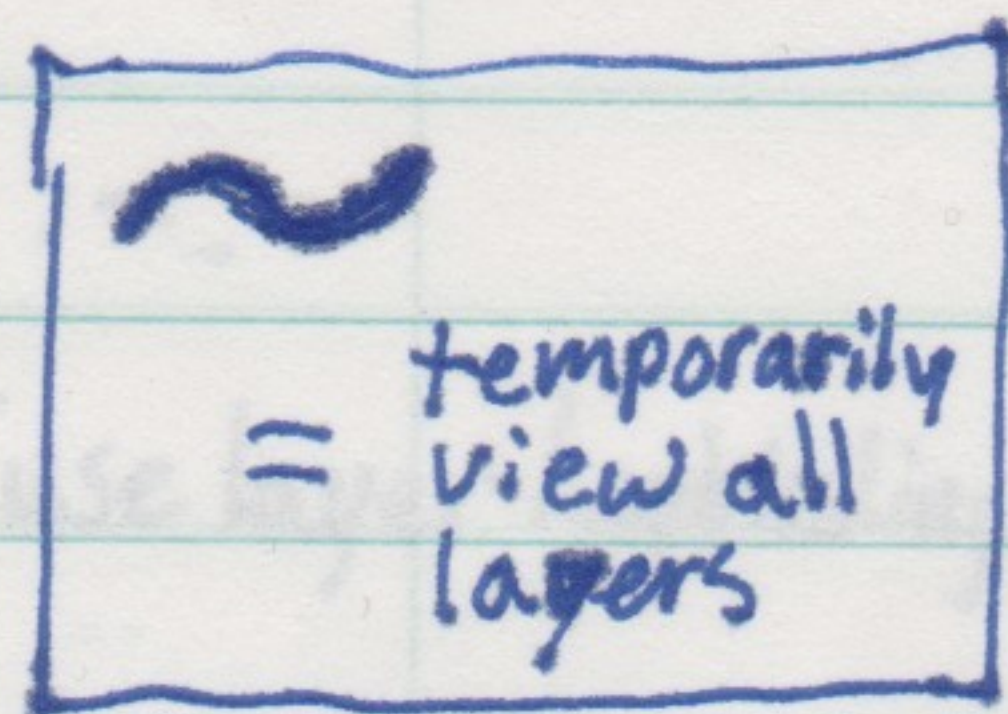
SHIFT + B Zoom to rectangle selection.

SHIFT + F Fly mode.

1-9, 0 Layer ~~1~~ 1-10 ~~key~~ switch.

ALT + 1-9, 0 Layer 11-20 switch.

SHIFT + Above Toggle instead of switch.



C	Brush (drag-select) selection mode
B	Rectangular selection mode
CTRL + I	Invert selection
A	Select all or nothing
H	Hide selected
SHIFT + H	Hide everything, except selected
ALT + H	Restore all hidden objects
NUM /	Creates a temporary "focus" (local) view. Everything except selection is hidden, camera readjusted.
G	Translate (move)
R	Rotate (turn)
S	Scale (resize)
R R	Free rotation
	(Shift = inverted) X, Y, Z to constrain to axis Follow by numbers for exact specification → twice to constrain to <u>local</u> axis!
ALT + .	Reorient pivot point to active object
CTRL + ,	Reorient pivot point to median point
CTRL + .	Reorient pivot point to per-object origin
.	Reorient pivot point to 3D cursor
,	Reorient pivot point to bounding box center
ALT + ,	Toggles center point manipulation (pitfall!)
NUM 0	Quick camera preview (toggle)
NUM 7	Top view
CTRL + NUM 7	Bottom view
NUM 1	Front view
CTRL + NUM 1	Back view
NUM 3	Left view
CTRL + NUM 3	Right view
SHIFT + R	Repeat last action
M	Move selected objects to layer (use layer keybindings!)
A A → W →	Remove doubles Remove all colliding edges (only in edge select mode)

Editing keybindings

SHIFT + A	Add mesh (shape/object).
TAB	Switch between Object and Edit mode.
DEL → Edge Loop	Selection as before, but for vertices/edges/faces
CTRL + TAB 1, 2, 3	In Edit mode, switch between vertex, edge, Face
CTRL + NUM +	Expand selection
CTRL + NUM -	Decrease selection
O	Toggle proportional editing ("smoothed" selection)
SHIFT + O	Switch proportional editing mode
Scroll	Change area of influence for proportional editing.
CTRL + Click	Create new node (will connect edge to selected vertex)
F	Complete vertices loop ~~creates face~~
	→ All vertices selected: creates Face
	→ First and last vertices selected: only creates final edge
When multiple vertices are selected as starting point, the above will construct sheets (edges + faces), rather than just edges.	
ALT + M	Merge vertices (collapse)
W	Special vertex operations (eg. remove doubles)
CTRL + N	Recalculate normals (fixes smooth shading issues)
CTRL + L	Select all recursively connected elements.
L	Same, but for element being hovered over.
SHIFT + L	Unselect all connected to hovered element.
P	Separate parts of a mesh.
CTRL + J (in Object mode)	Combine ("join") two meshes.
ALT + SHIFT + rClick	Select edge loop at once.
E	Extrude (requires ctrl+z after Esc to cancel!).
ALT + E	Special extrusion methods.

CTRL + R

Loop cut.

• Mouse wheel to change number of cuts.
CTRL + Z For cancelling after ESC.

DEL → Edge Loop

Delete edge loop. This will merge.

CTRL + E

Special edge operations.

~~CTRL + R~~

CTRL + SHIFT + ALT + C

Set origin (pop-up menu)

ALT + R

Spin tool

SHIFT + D

Duplicate (copy)

ALT + D

Duplicate (linked)

Parenting

Select child → Select parent → CTRL + P → Object